

# **HATCHERY EVALUATION REPORT**

**Turtle Rock - Steelhead**  
**December 1996**

**Integrated Hatchery Operations Team (IHOT)**

# **HATCHERY EVALUATION REPORT**

## **Turtle Rock - Steelhead**

### **An Independent Audit Based on Integrated Hatchery Operations Team (IHOT) Performance Measures**

Prepared by:

Montgomery Watson  
2375 130th Avenue NE  
Suite 200  
Bellevue, WA 98005

Prepared for:

U.S. Department of Energy  
Bonneville Power Administration  
Environment, Fish and Wildlife  
P.O. Box 3621  
Portland, OR 97208-3621

Project Number 95-2  
Contract Number 95AC49468

December 1996



# CONTENTS

Section 1 Executive Summary .....	1-1
Section 2 Facility Description .....	2-1
Section 3 Compliance Status .....	3-1
Section 4 Remedial Actions .....	4-1
Section 5 Hatchery Contribution to Fisheries, Spawning Grounds and Hatcheries ....	5-1
Section 6 Annual Operating Expenditures .....	6-1

## List of Tables

### Table

1	Summary Program Information for Turtle Rock - Steelhead
2	Compliance with Performance Measures: Turtle Rock - Steelhead
3	Remedial Actions Required at Turtle Rock - Steelhead
4	Adult Contribution to Fisheries, Spawning Grounds and Hatcheries: Turtle Rock - Steelhead
5	Annual Operating Expenses: Turtle Rock - Steelhead

6      Annual Operating Expenses - Turtle Rock Hatchery

## **Executive Summary**

This report presents the findings of the independent audit of the Turtle Rock - Steelhead program. The Turtle Rock Hatchery is located along the Columbia River 2 miles upstream from Rocky Reach Dam. The hatchery includes the old Rocky Reach Hatchery, located just downstream from Rocky Reach Dam. The hatchery is used for incubation and rearing of Summer Chinook and the rearing of steelhead.

The audit was conducted in 1996-1997 as part of a 2-year effort that will include 67 hatcheries and satellite facilities located on the Columbia and Snake River system in Idaho, Oregon, and Washington. The hatchery operating agencies include the U.S Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

### **Background**

The audit is being conducted as a requirement of the Northwest Power Planning Council (NPPC) Strategy for Salmon and the Columbia River Basin Fish and Wildlife Program. Under the audit, the hatcheries are evaluated against policies and related performance measures developed by the Integrated Hatchery Operations Team (IHOT). IHOT is a multi-agency group established by the NPPC to direct the development of new basinwide standards for managing and operating fish hatcheries. The Bonneville Power Administration (BPA) contracted with Montgomery Watson to act as an independent contractor for the audit.

IHOT has established five basic policies that cover: (1) hatchery coordination, (2) hatchery performance standards, (3) fish health, (4) ecological interaction, and (5) genetics. The audit focuses on all these policies, with the exception of hatchery coordination. These policies are set forth in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries (IHOT 1995)*. That document is the source for the performance measures that are the basis of this audit.

## **The Audit Process**

The audit was based on the facility management's response to a 109-page questionnaire. This audit form was completed through a five-step process in which:

- Information was obtained from headquarters.
- The hatchery manager was asked to fill out and return the audit form.
- A 1-2 day site audit visit was conducted to inspect facilities, review hatchery records, discuss audit form responses, and develop remedial action plans.
- A compliance report was developed to document the compliance status of each performance measure. This report was then shared with the hatchery manager and IHOT representative.
- This hatchery evaluation report was written to document compliance with IHOT performance measures and develop cost estimates for remedial actions when needed.

## **Turtle Rock - Steelhead Results**

The Turtle Rock Hatchery includes one rearing pond, 8 vinyl-lined raceways, and incubation facilities. The Turtle Rock Hatchery is operated as mitigation facilities for the fishery impacts caused by the construction and operation of Rocky Reach Dam.

The Turtle Rock - Steelhead program was in compliance with few of the performance measures. This was primarily a result of failing to fill out the audit form and/or provide the required information to the audit team.

The specific areas in which the Turtle Rock - Steelhead program requires remedial actions based on the IHOT performance measures are listed below. These remedial actions are listed in alphabetical order without intent of ranking or otherwise assigning priority:

- Conduct fishery contribution studies
- Construct acclimation ponds for releases
- Develop alarm logs
- Develop approved genetics monitoring and evaluation program
- Develop monitoring and evaluation plan
- Develop smoltification goal and monitor
- Develop specific rearing standards for IHOT Operations Plan
- Document adult contribution, fry-to-smolt survival, smolt production, and smolt to adult survival
- Document compliance with IHOT density and loading criteria for ponds
- Document density just prior to release, number at release, size at release, and dates of release
- Document DO and TGP levels
- Follow IHOT QA/QC for feed preparation
- Follow IHOT requirements for storage of buckets of feed
- Install alarms in raceway headboxes and rearing ponds
- Install security alarms
- Replace intake screens at Turtle Rock
- Review IHOT Operations Plan and discussion with staff
- Review IHOT requirement for disease-free water for rearing

- Review IHOT temperature criteria for rearing
- Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, and contaminants

Non-compliance issues resulting from items beyond human control or Performance Measures not relevant to this hatchery (Type 1 in Table 3, Section 4 of this report) were not listed above.

## Facility Description

**Name:** Turtle Rock Hatchery  
**Stock/Species:** Summer Chinook  
Steelhead

**Operating Agency:** Washington Department of Fish and Wildlife  
**Funding Agency:** Chelan PUD  
**Location:** The Turtle Rock Hatchery is located along the Columbia River 2 miles upstream from Rocky Reach Dam. The hatchery includes the old Rocky Reach Hatchery, located just downstream from Rocky Reach Dam.

**Address:** Turtle Rock Hatchery  
Eastbank Fish Hatchery Complex  
Washington Department of Fish and Wildlife  
13246 Lincoln Rock Road E  
East Wenatchee, WA 98802

**Hatchery Manager:** Mr. Steve Robards  
**Phone:** (509) 884-8301  
**Fax:** (509) 886-0823

**Purpose:** The Turtle Rock Hatchery is operated as mitigation facilities for the fishery impacts caused by the construction and operation of Rocky Reach Dam.

**Production Goal:** Summer Chinook

Produce 200,000 yearling summer chinook for release from Turtle Rock Hatchery

Produce 1,600,000 subyearling summer chinook for release from Turtle Rock Hatchery

### **Steelhead**

No information supplied

### **Water Supply:**

Water available for use in the Turtle Rock Hatchery averages 12,000 gpm and is from the Columbia River. Water rights for the Rocky Reach Satellite total 3,613 and are from the Columbia River

### **Facilities:**

Adult Holding: None

Incubation: None

Early Rearing: None

Raceways: None

Rearing Ponds: 1 concrete rearing pond - 29,700 cf

Satellite Facilities: Rocky Reach Satellite

40 8-stack vertical incubators (320 trays)

8 vinyl-lined raceways - 1,600 cf each

## Compliance Status

The hatchery audits are based on compliance with written IHOT performance measures. These performance measures are documented in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* (referred to as *IHOT 1995* in this report).

The purpose of the performance measures is to implement new basinwide policies that provide regional guidelines for operating anadromous hatcheries in the Columbia Basin.

The audit focuses on performance measures for IHOT policies that cover (1) hatchery performance standards, (2) fish health, (3) ecological interaction, and (4) genetics. These performance measures are intended to guide hatchery operations once production is established. For that reason, the hatchery operations audit included broodstock collection, spawning, incubation of eggs, fish rearing and feeding, fish release, equipment maintenance and operations, and personnel training. Production priorities are beyond the scope of this audit.

Based on *IHOT 1995*, a detailed 109-page audit form was developed. The audit form divided the performance measures into six major sections along major program and technical criteria areas. Two additional sections (sections 1 and 8) include general information and expenditure information needed for this Hatchery Evaluation Report and blank forms for additional comments. The following is the basic structure of the IHOT audit form:

- |           |  |
|-----------|--|
| Section 1 | Performance Measures for General Information and Expenditure Information (PMs General 1-2) |
| Section 2 | Performance Measures for Program Objectives (PMs 1-4)                                      |
| Section 3 | Performance Measures for Facility Requirements (PMs 5-15)                                  |

Integrated Hatchery Operations Team (IHOT) 1995. *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries*, Bonneville Power Administration, Portland, Oregon.

Section 4	Performance Measures for Hatchery Practices (PMs 16-25)
Section 5	Performance Measures for Fish Health Policy (PMs 26-34)
Section 6	Performance Measures for Ecological Interactions (PMs 35-38)
Section 7	Performance Measures for Genetics Policy (PMs 39-43)
Section 8	Blank Forms for Additional Comments

Several performance measures are repeated in various sections of the audit form. These performance measures overlap in *IHOT 1995* and were retained to allow individuals interested in specific portions of the audit (such as Genetics or Fish Health) to determine the compliance status of all performance measures for a given topic in one location. A repeated performance measure is indicated by shaded text.

## The Hatchery Audit Process

The hatchery audit will be conducted over a 2-year period that concludes in 1997. At each hatchery, a five-step process was used to complete the overall hatchery audit. This process consisted of research and onsite visits. The site visit at the Turtle Rock Hatchery was conducted on October 29, 1996.

The following is the five-step audit process:

1. Information was obtained from headquarters.
2. The hatchery manager was asked to fill out and return the **Audit Form**.
3. A 1-2 day site audit visit was conducted at each hatchery. During that visit an audit team inspected facilities, reviewed hatchery records, discussed audit form responses, and developed remedial action plans when appropriate.

4. During the site visit, the compliance status of each performance measure was discussed with the hatchery manager and IHOT representative. A portion of the Hatchery Evaluation Report was sent to the hatchery manager following the audit visit as a **Compliance Report**. That Compliance Report is Table 2 of this report.
5. Information from steps 1-4 was used to prepare a draft **Hatchery Evaluation Report**. This draft report was submitted to the operating agencies for review of the information used to determine compliance. Based on review and comments, a final Hatchery Evaluation Report was developed. The final report documents the compliance of a particular hatchery with the IHOT performance measures and presents cost estimates to correct any deficiencies.

## Compliance Status of Turtle Rock - Steelhead

The following table includes information on life-stages that are held on this facility for some portion of their rearing cycle (Table 1). For multi-facility programs, summary cost and contribution data is presented at the facility where rearing occurs. For the compliance status relating to performance measures that do not occur at this hatchery, please refer to the Hatchery Evaluation Reports for the hatcheries and stocks listed in Table 1. A check mark (4) indicates that the specific life-stage is held at this facility.

This section documents the compliance status of the Turtle Rock - Steelhead program. Each performance measure is presented in a table taken from the audit form (Table 2). The compliance status is identified by the following categories:

- **N/A** (not applicable)
- **Yes** (in compliance)
- **?** (unknown; generally due to unavailability of information to determine compliance)
- **No** (not in compliance).

Remedial actions are suggested for performance measures not in compliance. These remedial actions are grouped into categories and listed in Section 4 of this report, where the cost of the required remedial actions is also presented.

**Table 1 Summary Program Information for Turtle Rock - Steelhead**

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	Wells Hatchery	Chelan Hatchery	Turtle Rock Hatchery			
Adult Collection	4					
Adult Holding	4					
Spawning	4					
Fertilization	4					
Incubation						
green-to-eyed	4					
eyed-to-hatch		4				
Rearing						
fry		4				
fingerlings			4			
smolts			4			
Acclimation/release			4			

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#1	Are the hatchery programs outlined in a subbasin management plan?		4			Columbia Basin System Planning Production Plan and FERC Agreement (Rocky Reach Dam)	
#2	Is the hatchery operating under a current hatchery operational plan?  Is it understood by staff?  Is it being followed?				4  4  4	IHOT Operations Plan  See above  See above	Review IHOT Operations Plan  Discuss Operations Plan with staff  Discuss Operations Plan with staff
#3	Is a hatchery monitoring and evaluation plan in place?  Do you have a written monitoring and evaluation plan?				4	No plan	Develop monitoring and evaluation plan
#4a	Adult contribution to fisheries, spawning grounds, and hatchery				4	No information provided	Document adult contribution
#4b	Adult pre-spawning survival as compared with established goal	4				Adults collected at Wells Hatchery	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#4c	<b>Egg-take as compared with established hatchery goal</b>	4				Adults collected at Wells Hatchery	
#4d	<b>Green-egg to eyed-egg survival as compared with established goal</b>	4				Incubation at Wells Hatchery	
#4e	<b>Eyed-egg to fry survival as compared with established goal</b>	4				Incubation at Chelan Hatchery	
#4f	<b>Fry to smolt survival as compared with established goal</b>				4	No information provided	Document fry-to-smolt survival
#4g	<b>Production as compared with established goal</b>				4	No information provided	Document smolt production
#4h	<b>Percent survival (smolt to adult) as compared with established goal</b>				4	No information provided	Document smolt to adult survival
#4i	<b>Number of eggs, fry, fingerlings, smolts, and/or adults to meet basinwide needs</b>	4				No information provided	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#5a	<b>Temperature</b>						
	Does your water temperature meet the criteria for spawning?	4				No spawning at Turtle Rock Hatchery	
	Does your water temperature meet the criteria for incubation?	4				No incubation at Turtle Rock	
	Does your water temperature meet the criteria for rearing?				4	Review of data. Use ambient Columbia River; too warm, too cold.	Review IHOT temperature criteria for rearing
#5b	<b>Dissolved gases</b>						
	Is the oxygen level near saturation?			4		System designed for compliance for oxygen and nitrogen	Document DO levels
	Is the dissolved nitrogen level less than saturation?			4		See above	Document TGP levels
#5c	<b>Chemistry</b>						
	Ammonia (un-ionized)			4		No data provided	Run analysis for chemistry parameters
	Carbon Dioxide			4		See above	See above
	Chlorine			4		See above	See above
	pH			4		See above	See above
	Copper			4		See above	See above
	Hydrogen Sulfide			4		See above	See above
	Iron			4		See above	See above
	Zinc			4		See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#5d	<b>Turbidity</b>						
	Does your turbidity meet the criteria?			4		No data provided	Run analysis for turbidity

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#5e	<b>Alkalinity and hardness</b>						
	Does your alkalinity and hardness meet the criteria?			4		No data provided	Run analysis
#5f	<b>Nitrite</b>						
	Does your nitrite meet the criteria?			4		No data provided	Run analysis
#5g	<b>Contaminants</b>						
	Aldrin			4		No data provided	Run analysis
	Endrin			4		No data	See above
	Dieldrin			4		No data	See above
	Heptachlor			4		No data	See above
	Chlordane			4		No data	See above
	Methoxychlor			4		No data	See above
	Lindane			4		No data	See above
	Malathion			4		No data	See above
	Guthion			4		No data	See above
#5h	<b>Pathogens</b>						
	What portions of the hatchery have disease-free water?						
	Adult holding	4					
	Incubation	4				No incubation at Turtle Rock	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Early rearing	4				No early rearing at Turtle Rock	
	Rearing				4	River water	Review IHOT requirement for disease-free water for rearing
	Others	4					

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#6	<b>Alarm Systems</b>						
	Do the following areas have alarms?						
	Intake		4			Call in alarms from PUD	
	Large rearing ponds and adult holding ponds	4				Inspection/Discussion	
	Raceway headboxes and rearing ponds				4	Inspection/Discussion	Install alarms in raceway headboxes and rearing ponds
	Incubation facilities	4				Inspection/Discussion	
	Quarantine areas and facilities	4				Inspection/Discussion	
	Water treatment systems	4				Inspection/Discussion	
	Security				4	Inspection/Discussion	Install security alarms
	Are there outside systems and buzzers in onsite residences?		4			Discussion	
	Are water flow alarms checked daily?		4			Review of records/Discussion	
	Are all other alarms checked weekly?		4			Discussion	
	Is there a log of alarms for emergencies, tests, and maintenance requirements?				4	Discussion	Develop alarm log

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Are telephone pagers used?		4			Discussion; duty person wears pager	
#7	<b>Adult collection and holding facilities</b>						
	Do you meet the adult holding criteria?	4				No adult held at hatchery	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#8	<b>Incubation facilities</b>						
	Type 1: Do you have an adequate number of units for the overall program?	4				No incubation at this hatchery	
#9	<b>Rearing facilities</b>						
	Type 1: ponds Do you have an adequate number of units for the overall program?		4			Discussion	
	Type 2: Do you have an adequate number of units for the overall program?	4					
	Type 3: Do you have an adequate number of units for the overall program?	4					

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#10	<b>Screening facilities</b>						
	Do you meet the approach velocity criteria?				4	Inspection of facilities/Discussion	Replace intake screens at Turtle Rock
	Are the fish screens regularly cleaned?		4			Inspection of facilities/Discussion	
	Does the screen mesh meet screen opening criteria?				4	Inspection of facilities/Discussion	See above
	Are rearing containers double screened for fish that should not be released to adjacent water?		4			Inspection of facilities/Discussion	
#11	<b>Predator control facilities</b>						
	Are your predation control facilities effective?		4			Inspection	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#12	<b>Food storage facilities and quality control</b>						
	Does the storage of dry/semi-moist/moist foods (dry<12%; semi-moist 12-20%; moist >20% moisture) follow food manufacturer's recommendations?		4			Inspection of facilities/Discussion	
	Does a regional quality control officer oversee production procedures and monitor:						
	Verification by feed manufacturer that ingredients meet specifications?				4		Follow IHOT QA/QC for feed preparation
	Ensure feed does not contain unwanted drugs or other additives?				4		Follow IHOT QA/QC for feed preparation
	Analyze ingredients contained in the final food product to ensure that feed specifications have been met?				4		Follow IHOT QA/QC for feed preparation
	Are the foods stored and handled according to the following criteria?						

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Moist pellets should not exceed 10°F at point of delivery.		4			Discussion	
	Moist pellets should be removed from freezer just prior to feeding.		4			Discussion	
	Do not leave buckets of feed or feed containers outside exposed to light or heat.				4	Discussion	Follow IHOT requirements for storage of buckets of feed
	Open bags of feed should be fed within 1 to 2 days except when feeding small groups of fish.		4			Discussion	
	Automatic feeder hoppers and bulk storage facilities should be insulated against excessive temperatures (80°F and above).		4			Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#13	<b>Release facilities</b>  Do the release facilities ensure that fish are not subjected to adverse conditions?		4			Inspection of facilities/Discussion	
#14	<b>Pollution abatement facilities</b>  Do the pollution abatement facilities meet all federal and state regulations (or good engineering practice)?  Are pollution abatement facilities operated correctly?		4  4			Inspection of facilities/Discussion  Discussion	
#15	<b>Transportation facilities</b>  Are the transport systems adequate to meet IHOT performance measures for transportation practices?		4			Transportation by Eastbank Hatchery	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#16	<b>Broodstock selection practices</b>						
	Is the donor selection process document attached? (PM #40a)	4				Existing program; does not apply	
	Was the donor selection outline followed in selecting the hatchery broodstock? (PM #40b-c)	4				Existing program; does not apply	
#17	<b>Spawning practices</b>						
	Were the appropriate number of spawners, male/female ratios, and fertilization protocols used? (PM #42c-g)	4				Spawning at Wells Hatchery	
#18	<b>Incubation practices</b>						
	Are specific incubation standards listed in the hatchery operations plan?	4				No incubation for this program at Turtle Rock	
	Are incubation practices written?	4				See above	
	Incubation Type 1: vertical (see PM #8)	4				See above	
	Do you meet the loading and flow criteria?						

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Incubation Type 2: (see PM #8)  Do you meet the loading and flow criteria?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#19	<b>Rearing practices</b>						
	Are specific rearing standards listed in the hatchery operations plan?				4	Review IHOT Hatchery Operations Plan	Develop specific rearing standards for IHOT Operations Plan
	Are rearing practices written?				4	Review Hatchery Operations Plan	See above
	Rearing Unit Type 1: ponds (see PM #9)						
	Do you meet the density and DI criteria?			4		No information provided	Document density and loading for ponds
	Do you meet the Loading and FI criteria?			4		No information provided	
	Rearing Unit Type 2: (see PM #9)						
	Do you meet the density and DI criteria?	4					
	Do you meet the Loading and FI criteria?	4					
	Rearing Unit Type 3: (see PM #9)						
	Do you meet the density and DI criteria?	4					
	Do you meet the Loading and FI criteria?	4					
#20	<b>Smolt quality</b>						
	Do you produce a high quality smolt?		4			Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#21	<b>Fish health management practices</b>						
	Are the monthly hatchery monitoring visits being conducted? (PM #26)		4			Review of records/Discussion	
	Are the annual broodstock inspections being conducted? (PM #27)		4			Review of records/Discussion	
	Is there pathogen-free water (PM #5h) and are the sanitation procedures being followed? (PM #28)				4	Review of records/Discussion	See PM #5h
	Are the following water quality parameters within criteria? (PM #5a-5g)						
	Water temperature				4	Review of records/Discussion	See PM 5a
	Dissolved gases			4		Review of records/Discussion	See PM 5b
	Chemistry			4		Review of records/Discussion	See PM 5c
	Turbidity			4		Review of records/Discussion	See PM 5d
	Alkalinity and hardness			4		Review of records/Discussion	See PM 5e
	Nitrite			4		Review of records/Discussion	See PM 5f
	Contaminants			4		Review of records/Discussion	See PM 5g
	Are rearing standards being followed? (PM #19)			4		Review of records/Discussion	See PM #19

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Are egg and fish transfer/release requirements met? (PM #31)		4			Review of records/Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#22a	<b>Does hatchery performance meet requirements outlined in the regional hatchery policies and in subbasin and hatchery plans for the following areas?</b>						
#22a1	<b>Percent smoltification</b> Do you measure percent smoltification?  Did you meet the smoltification criteria?			4	4	Discussion  Discussion	Develop smoltification goal and monitor  See above
#22a2	<b>Rearing density (prior to release)</b>  Did you meet the rearing density criteria just prior to release?			4		No information provided	Document rearing density just prior to release
#22a3	<b>Disease condition (at release)</b>  Did you meet all disease regulations just prior to release?		4			Discussion	
#22a4	<b>Number (at release)</b>  Did you meet the release number goal?			4		No information provided	Document release numbers
#22a5	<b>Size at release</b>  Did you meet the size goal?			4		No information provided	Document size at release

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#22a6	<b>Dates of release</b>						
	Did you meet the release date goal?			4		No information provided	Document dates of release
#22a7	<b>Location of release</b>						
	Did you release the fish at the specified location?		4			Discussion	
#22b	<b>Are fish reared in the subbasin or acclimated in the subbasin?</b>						
	Are the fish reared in the subbasin?		4			Discussion	
	Are the fish acclimated in the subbasin?				4	Discussion	Construct acclimation ponds for releases
#22c	<b>Is the release strategy appropriate for the program?</b>		4			Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#23	<b>Transportation facilities</b>						
	Do transportation equipment and personnel receive disinfection before and after use?	4				Transport by Eastbank Hatchery	
	Is the fish tank interior disinfected using a solution of 200 ppm active chlorine for 30 minutes minimum or formaldehyde gas generation method (relative humidity of 60% for 2 hrs)?	4				See above	
	Is the exterior of the fish transport vehicle disinfected using high pressure steam (115-130°C), high temperature acid, or with 200 ppm chlorine for 30 minutes?	4				See above	
	Is the fish transport vehicle (cab) disinfected using 600 ppm quaternary ammonia compounds (1.5 ml of 50% stock solution/liter water)?	4				See above	
	Is other equipment disinfected including fish pumps, nets, egg sorters, waders, boots, rain gear, hoses and other equipment using one of the following solutions?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	200 ppm chlorine for 30 minutes 600 ppm quaternary ammonia compound for 30 minutes 200 ppm iodophor solution for 10 minutes	4				See above	
	Do personnel wear protective garments when handling fish eggs or cultural water?	4				See above	
	Do the fish transport truck/chassis and tank/unit receive an inspection and service prior to the release season?	4				See above	
	Is a daily service inspection completed before starting up and leaving for the day?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#23 (cont)	<b>Transportation facilities</b>						
	Does the fish transport unit receive an inspection prior to loading?	4				Transport by Eastbank Hatchery	
	Does a pre-loading inspection covering tank water level, pumps or aerators, oxygen injection system settings, displacement gauge, and truck loading/hauling density tables checked and reviewed occur prior to loading fish in the transport unit?	4				See above	
	Do hauling criteria include checking the fish 45 minutes to 1 hour after loading?	4				See above	
	When fish are active and systems are functioning properly, is the oxygen concentration reduced and maintained at approximately 8 ppm?	4				See above	
	Is water temperature in the transportation unit maintained within the 42-48 °F range?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Do fish releasing procedures include the following criteria?						
	Releasing the fish at the correct release site or into the correct water body.	4				See above	
	Tempering or the difference between the liberation tank and the target water body should not exceed 10°F.	4				See above	
	The liberation hose should be angled so that fish gently hit the water. Using a tripod is a method of ensuring the hose will stay at the proper angle.	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#24	<b>Evaluation practices</b>						
	Has the hatchery conducted fishery contribution studies to:						
	Determine the requirements for evaluating and improving management programs?				4	Discussion	Conduct fishery contribution studies
	Develop guidelines that define the geographical area and identify component stocks (hatchery and/or wild) that comprise the management unit?				4	Discussion	See above
	Develop guidelines that define if the proper stocks of fish are currently being used?				4	Discussion	See above
	Determine which management units contribute to a specific fishery and the time periods of those contributions?				4	Discussion	See above
	Determine the relative contributions of the various management units to a specific fishery over the different time periods?				4	Discussion	See above

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#25	<b>Training practices</b>						
	Does the hatchery have a training schedule for its staff?		4			Discussion	
	Does each staff member have a personal training plan approved by a supervisor and reviewed annually?		4			Discussion	
	Does the hatchery routinely exchange training details between other hatcheries and agencies?		4			Discussion	
	Does the hatchery encourage and reward off-duty training of staff?		4			Discussion	
	Does the hatchery conduct monthly staff meetings?		4			Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#26	<b>Are monthly hatchery monitoring visits being conducted by a qualified fish health specialist as described below?</b>						
	Conduct visit at least monthly		4			Inspection of records/Discussion	
	Monitoring conducted by qualified fish health specialist		4			See above	
	Examine a representative sample of healthy and moribund fish from each lot.		4			See above	
	Review fish culture practices with hatchery manager.		4			See above	
	Report finding and results of necropsies on standard form.		4			See above	
	Recommend appropriate drug or chemical treatment.		4			See above	
	Summarize fish health status or stock prior to release or transfer to another facility.		4			See above	
#27	<b>Are all of the functions of the hatchery yearly monitoring visits being completed as described below?</b>						

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Annually examine each broodstock for the presence of reportable viral pathogens.	4				At Wells Hatchery	
	Annually screen each salmon broodstock for the presence of <i>Renibacterium salmoninarum</i> .	4				See above	
	Conduct inspection by or under the supervision of qualified fish health specialist.	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#28	<b>Is the hatchery following accepted sanitation procedures?</b>						
	Are there any sources of pathogen-free water, especially for incubation and early rearing?	4				No incubation or early rearing at this hatchery	
	Are the hatchery sanitation procedures understood and being followed as described below?						
	Disinfect/water harden eggs in iodophor?	4				No incubation at this hatchery	
	Are foot baths containing disinfectant placed at the incubation facility's entrance and exit?	4				See above	
	Is equipment and rain gear utilized in broodstock handling or spawning sanitized prior to its use elsewhere in the hatchery?	4				See above	
	Is equipment used to collect dead fish sanitized prior its use in another pond and/or lot of fish?		4			Discussion/inspection of facilities	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Is equipment, including vehicles used to transfer fish between facilities, disinfected prior to use with any other fish lots or at any other location?		4			See above	
	Are rearing vessels sanitized after fish are removed and prior to introducing a new fish lot or stock?		4			See above	
	Are dead fish properly disposed of?		4			See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#29	<b>Are water quality parameters being followed?</b>						
	Are the following water quality parameters within criteria? (PM #5a-5g)						
	Water temperature				4	Review of records/Discussion	See PM #5a
	Dissolved gases			4		No data	See PM #5b
	Chemistry			4		No data	See PM #5c
	Turbidity			4		No data	See PM #5d
	Alkalinity and hardness			4		No data	See PM #5e
	Nitrite			4		No data	See PM #5f
	Contaminants			4		No data	See PM #5g
	Go to PM #21						
#30	<b>Are incubation and rearing standards being followed?</b>						
	Are the incubation practices following the IHOT incubation criteria? (PM #18)	4				No incubation at Turtle Rock for this program	See PM #18
	Are the rearing practices following the IHOT criteria? (PM #19)			4		No plan; rearing conditions in ponds not documented	See PM #19
	Go to rearing practices PM #18-PM #19						
#31	<b>Are egg and fish transfer/release requirements met?</b>		4			Cleared by Tami Black	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#32	<b>Is the hatchery's program outlined in a subbasin management plan?</b>  Go to subbasin plan PM #1		4			Columbia Basin System Planning Production Plan and FERC Agreement	
#33	<b>Is the hatchery operating under a current hatchery operational plan?</b>  Go to operational plan PM #2				4	Review of IHOT Operations Plan	See PM #2
#34	<b>Is a hatchery monitoring and evaluation plan in place?</b>  Go to hatchery monitoring and evaluation plan PM #3				4	No plan	See PM #3

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#35	Does the hatchery program meet requirements established in the regional hatchery policies and subbasin planning documents in the following areas:  species, stock, broodstock collection location, broodstock numbers, broodstock collection strategy, and spawning and egg-take protocols?						
	Does the hatchery program meet the requirements for the following?						
	Species protocols (PM #4a)	4				At Wells Hatchery	
	Stock protocols (PM #4a)	4				See above	
	Broodstock collection location protocols (PM #41b)	4				No broodstock collected in this hatchery	
	Broodstock numbers protocols (PM #42c)	4				See above	
	Broodstock collection strategy protocols (PM #41b-d)	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
	Spawning protocols (PM #42d-e)	4				See above	
	Egg-take protocols (PM #42f-g)	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#36	<b>Does the hatchery's performance meet requirements outlined in the regional hatchery policies and in subbasin and hatchery plans for the following areas: percent smoltification, rearing density, disease condition, and the number, size date(s), and location of release?</b>						
	Percent smoltification (PM #22a1)				4	Discussion	See PM #22a1
	Rearing density (PM #22a2)			4		Discussion	See PM #22a2
	Disease condition (PM #22a3)		4			Discussion	
	Number at release (PM #22a4)			4		Discussion	See PM #22a4
	Size at release (PM #22a5)			4		Discussion	See PM #22a5
	Date of release (PM #22a6)			4		Discussion	See PM #22a6
	Location of release (PM #22a7)		4			Review of records/Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#37	<b>Are fish reared in the subbasin or acclimated in the subbasin?</b>  See PM #22b				4	Reared in the subbasin but not acclimated in the subbasin	See PM #22b
#38	<b>Is the release strategy appropriate for the program?</b>  See PM #22c		4			Discussion	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#39	<b>For new programs, has a broodstock collection plan been developed?</b>						
	Is the broodstock collection plan written?	4				Existing Program; does not apply	
	For a non-captive broodstock program:	4				Existing Program; does not apply	
	Was an unbiased, representative sample collected?						
	Was the recommended number of broodstock collected?	4				Existing Program; does not apply	
	For a captive broodstock program:						
	Were captive brood progeny excluded as donors for propagating the next generation of the captive broodstock program?	4				Existing Program; does not apply	
	Were full-sib crosses avoided?	4				Existing Program; does not apply	
	Is the broodstock collection plan understood and being followed by staff?	4				Existing Program; does not apply	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

		N/A	Yes	?	No		
#40	<b>For a new program, was the donor selection outline followed in selecting the hatchery broodstock?</b>						
#40a	Is a donor selection plan written?	4				Existing Program; does not apply	
#40b	Was the donor selection outline followed in selecting the broodstock?	4				Existing Program; does not apply	
#40c	Was the target stock recommended in the donor selection process actually used?	4				Existing Program; does not apply	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#41	<b>For existing programs, were the broodstock collection procedures followed?</b>						
#41a	Is the broodstock collection plan written?	4				No broodstock collected at this hatchery	
	Does the broodstock collection plan follow the guideline:						
#41b	Was an unbiased, representative sample collected?	4				See above	
#41c	Was the recommended number of broodstock collected?	4				See above	
#41d	Were the broodstock collection procedures in hatchery operation plan understood and followed?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#42	<b>Was the appropriate number of spawners, male/female ratios, and fertilization protocols used?</b>						
#42a	Are the spawning protocols written?	4				No spawning at this hatchery	
#42b	Are daily or weekly spawning logs available?	4				See above	
#42c	Was the appropriate number of spawners used?	4				See above	
#42d	Did you attempt to spawn all collected broodstock and randomize mating with respect to age class, and other traits?	4				See above	
#42e	Was the sex-ratio within the limits given in the performance standards?	4				See above	
#42f	Were the fertilization protocols followed?	4				See above	
#42g	If the hatchery needed to reduce the number of eggs retained, was this done by representative sampling of each male/female cross?	4				See above	

**Table 2 Turtle Rock Hatchery - Steelhead Compliance With Performance Measures**

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#43	<b>Is there a genetics monitoring and evaluation program in place?</b>						
	Is a genetics monitoring and evaluation program available?				4	No plan	Develop approved genetics monitoring and evaluation program
	Does the plan address the following elements listed in IHOT:						
	Does the program have elements needed to meet evaluation goals 1-4?				4	Discussion	See above
	Has a qualified geneticist reviewed and endorsed the program (goal 5)?				4	Discussion	See above
	Will the program collect the data and maintain the records needed to evaluate compliance on an ongoing basis (goal 5)?				4	Discussion	See above
	Is the program understood and followed by staff?				4	Discussion	See above

## Remedial Actions

Based on the compliance status for each performance measure, remedial actions were developed. The required remedial actions are organized into five categories. The types of categories range across a spectrum from those actions that are beyond human control, to those that require a change in agency policy or procedures, to those that involve a significant capital cost to put in place. The following are the five types of remedial actions identified under phase 1 of the audit:

### The Five Types of Remedial Actions

Type	Description
1	Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery
2	Remedial actions requiring changes in agency policies or procedures
3	Remedial actions requiring changes in monitoring coverage or interval
4	Remedial actions requiring significant capital expenditures
5	Remedial actions that may require significant capital expenditures but are not clearly definable at this time

### Remedial Actions at Turtle Rock - Steelhead

This section presents the corrective actions required to bring the Turtle Rock - Steelhead program into compliance with IHOT performance measures. The remedial actions suggested here are just that, suggestions developed by the Montgomery Watson Audit Team. For some non-compliance areas, other remedial actions could be proposed. The required remedial actions are cross-referenced to each IHOT performance measure that was not in compliance. Where appropriate, the costs associated with the remedial actions are also presented (Table 3).

The cost estimates presented in this section are based on professional experience from similar projects. In most cases, only a lump-sum figure is presented, and detailed take-off lists have not been prepared. The cost estimates are essentially order of magnitude estimates ( $\pm 40\%$ ).

More importantly, the suggested remedial activities may also present several levels of action. Optional actions have been listed for several problems. These optional actions are desirable for either operational or safety considerations.

**Table 3. Remedial Actions Required at Turtle Rock - Steelhead**

Remedial Action Required	Cost	PMS <sup>1</sup>
<b>Type 1</b> - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery None	----	
<b>Type 2</b> - Remedial actions requiring changes in agency policies or procedures		
Review IHOT Operations Plan and discussion with staff	----	2
Develop monitoring and evaluation plan	----	3
Document adult contribution, fry-to-smolt survival, smolt production, and smolt to adult survival	----	4a, 4f, 4g, 4h
Review IHOT temperature criteria for rearing	----	5a
Review IHOT requirement for disease-free water for rearing	----	5h
Develop alarm logs	----	6
Follow IHOT QA/QC for feed preparation	----	12
Follow IHOT requirements for storage of buckets of feed	----	12
Develop specific rearing standards for IHOT Operations Plan	----	19
Document compliance with IHOT density and loading criteria for ponds	----	19
Develop smoltification goal and monitor	----	22a1
Document density just prior to release, number at release, size at release, and dates of release	----	22a2, 22a4, 22a5, 22a6
Conduct fishery contribution studies	----	24
Develop approved genetics monitoring and evaluation program	----	43

Remedial Action Required	Cost	PMS <sup>2</sup>
<b>Type 3</b> - Remedial actions requiring changes in monitoring coverage or interval		
Document DO and TGP levels	----	5b
Run analysis for water chemistry parameters, turbidity, alkalinity, hardness, and contaminants	----	5c-5g
<b>Type 4</b> - Remedial actions requiring significant capital expenditures		
Install alarms in raceway headboxes and rearing ponds	\$10,000	6
Install security alarms	\$5,000	6
Replace intake screens at Turtle Rock	Replacement underway	10
<b>Type 5</b> - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
Construct acclimation ponds for releases	----	

## Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Turtle Rock - Steelhead program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries. Data is reported by broodyear. A broodyear refers to the adult contribution from the eggs produced from a single group of spawning adults. For some species, this may include fish caught as 2-, 3-, 4-, 5-, and 6-year old fish. Because of the return distribution and data processing delays, the complete adult contribution for a given broodyear may not be available until 4 to 5 years after the fish have been released from the hatchery.

**Table 4. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:  
Turtle Rock - Steelhead**

<b>Year</b>	<b>Fisheries  (Broodyear)</b>	<b>Spawning Grounds<sup>1</sup>  (Broodyear)</b>	<b>Hatchery<sup>1</sup>  (Broodyear)</b>	<b>Total Combined Contribution  (Broodyear)</b>	<b>Smolt to Adult Survival (percent)</b>
1984					
1985					

Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.

Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

1986					
1987	No information provided	No information provided	No information provided	No information provided	No information provided
1988	No information provided	No information provided	No information provided	No information provided	No information provided
1989	No information provided	No information provided	No information provided	No information provided	No information provided
1990	No information provided	No information provided	No information provided	No information provided	No information provided
1991	No information provided	No information provided	No information provided	No information provided	No information provided
1992					

## Annual Operating Expenditures

The level and detail of annual operating expenditures varies widely depending on hatchery, operating agency, and funding source. When provided, expenditures were presented in terms of personnel costs, operating costs (power, feed, supplies), capital costs, indirect costs charged to the federal government, third-party costs, and other costs. These cost components were summed to determine a total hatchery annual cost. Based on discussion with the hatchery manager, the percent of total hatchery costs allocated to a given program was estimated. The total hatchery costs and the percent of hatchery costs allocated to a given program were used to compute the cost of a given program. Table 5 shows the annual operating expenses for the Turtle Rock - Steelhead program. For programs that occur at more than one facility (as shown on Table 1 in Section 3 of this report), the cost breakdown for the component(s) at each facility is presented in separate tables (Tables 5a, 5b, and 5c).

**Table 5. Annual Operating Expenses: Turtle Rock - Steelhead**

Hatchery	1993	1994	1995
1. Turtle Rock Hatchery	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied

2. Wells Hatchery	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied
3. Chelan Hatchery	No information provided	No information provided	No information provided
4.			
5.			
<b>Total Program Costs</b>	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied

The total expenditures for the Turtle Rock Hatchery are presented in Table 6 by program. The detailed breakdown of program expenditures at this hatchery are presented in separate tables (Tables 6a and 6b).

**Table 6. Annual Operating Expenses - Turtle Rock Hatchery**

<b>Program</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
1. Summer Chinook	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied
2. Steelhead	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied
3.			
4.			
5.			
<b>Total Hatchery Costs</b>	<b>\$269,523</b>	<b>\$315,898</b>	<b>\$419,893</b>

**Table 5a. Annual Operating Expenses: Turtle Rock - Steelhead**

**Expenditure Occurring at Turtle Rock**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$130,620	\$132,722	\$152,294
Operational Costs	\$76,188	\$120,461	\$204,884
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs			
Lumped Third-Party Costs	\$62,715	\$62,715	\$62,715
<b>Total Hatchery Costs</b>	<b>\$269,523</b>	<b>\$315,898</b>	<b>\$419,893</b>
<b>Source of Funds</b>			
Chelan PUD			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	No information provided	No information provided	No information provided

When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

<b>Program Costs</b>	Not possible to compute with information provided	Not possible to compute with information provided	Not possible to compute with information provided
----------------------	--	--	---

**Table 5b. Annual Operating Expenses: Turtle Rock - Summer Chinook**

**Expenditure Occurring at Wells Hatchery**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs	\$651,858	\$627,609	\$650,000
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	<b>\$651,858</b>	<b>\$627,609</b>	<b>\$650,000</b>
<b>Source of Funds</b>			
	<b>100%</b>	<b>100%</b>	<b>100%</b>
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			

When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

<b>Program Costs</b>	Not possible to compute with the information supplied	Not possible to compute with the information supplied	Not possible to compute with the information supplied
----------------------	--	--	---

**Table 5c. Annual Operating Expenses: Turtle Rock - Summer Chinook**

**Expenditure Occurring at Chelan Hatchery**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs			
Operational Costs			
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs			
Lumped Third-Party Costs			
<b>Total Hatchery Costs</b>	No information provided	No information provided	No information provided
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total			
<b>Program Costs</b>	No information provided	No information provided	No information provided

When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.



**Table 6a. Detailed Expenditures at Turtle Rock Hatchery by Program**

**Summer Chinook**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$130,620	\$132,722	\$152,294
Operational Costs	\$76,188	\$120,461	\$204,884
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs			
Lumped Third-Party Costs	\$62,715	\$62,715	\$62,715
<b>Total Hatchery Costs</b>	<b>\$269,523</b>	<b>\$315,898</b>	<b>\$419,893</b>
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	No information provided	No information provided	No information provided

When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

<b>Program Costs</b>	Not possible to compute with information provided	Not possible to compute with information provided	Not possible to compute with information provided
----------------------	--	--	---

**Table 6b. Detailed Expenditures at Turtle Rock Hatchery by Program**

**Steelhead**

<b>Component</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Personnel Costs	\$130,620	\$132,722	\$152,294
Operational Costs	\$76,188	\$120,461	\$204,884
Capital Costs			
Indirect Costs			
Lumped Hatchery Costs			
Lumped Third-Party Costs	\$62,715	\$62,715	\$62,715
<b>Total Hatchery Costs</b>	<b>\$269,523</b>	<b>\$315,898</b>	<b>\$419,893</b>
<b>Source of Funds</b>			
Program Production (lb)			
Total Production (lb)			
Program as Percent of Total	No information provided	No information provided	No information provided

When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

<b>Program Costs</b>	Not possible to compute with information provided	Not possible to compute with information provided	Not possible to compute with information provided
----------------------	--	--	---

PMs are performance measures that were extracted from the IHOT 1995 report. The IHOT performance measures are listed in Table 2 (Section 3 of this report) in numerical order.

PMs are performance measures that were extracted from the IHOT 1995 report. The IHOT performance measures are listed in Table 2 (Section 3 of this report) in numerical order.